Ecological Complexity and Sustainability

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availability is most responsible for plant growths at lower altitudes, whereas, low temperature mainly controlled plant growth at higher attitude. The research is helpful for better understanding how environmental variables controlled vegetation distribution on the Tibetan Plateau. It would provide theoretical evidence for forecasting and simulating the future vegetation distribution under the conditions of climate changes on the Tibetan Plateau.

Flora, Distribution and Phonological Characteristics of Allergenic Pollen Plants in Beijing Urban Area.

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In order to know the species composition, distribution pattern, and phonological characteristics of allergenic pollen plants in Beijing urban area, an investigation was carried out. For the methodology, firstly, by literature summary, allergenic pollen plants species in Beijing were found out. Then, according to results of the plant survey in Beijing urban area completed by Research Center for Eco-Environmental Sciences of Chinese Academy of Sciences, distribution pattern of allergenic pollen plants were determined in Beijing's different functional areas. Thirdly, face-to-face interviews were constructed with experts in Beijing Union Medical Collage Hospital in order confirm species composition of allergenic pollen plants and master recent epidemiological trend of pollinosis in Beijing. The results can be summarized in the following 4 aspects: (1) Within the fifth ring of Beijing, there were totally 99 allergenic pollen plants species, belonging to 32 genera and 19 families, within which 52 species were native plants accounting for 52.53% of total urban allergenic pollen plant; 26 species were introduced from other regions of China, 26.26% of the total, and 31 species were introduced from foreign countries, 31.31% of all. (2) The floristic analysis suggested that the flora of allergenic pollen plants in Beijing urban area was mainly based on North Temperate elements with the ratio 40.63%, and the following elements were form Cosmopolitan and Pantropic, accounting namely for 18.8% and 6.3%. (3) In all functional areas, the allergenic pollen plants were most diversified in urban parks, and the ratio of allergenic pollen plants was the highest in roads. Additionally, the coverage of herbs with strong pollen allergy was in the order of waste lands> Gym centers and institution yards> roads> parks> residential areas> squares. (4) Blooming period of allergenic pollen arbors in Beijing were aggregated in March ~ April, while herbs in July ~ September.

Keywords: Allergenic pollen plants ; Urban ecosystem ; Species Composition ; Distribution ; Phonological characteristics.

Variation of Air Pollutants and Their Relationship with Meteorological Conditions in Beijing

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The variations of concentrations of the air pollutants monitored in the long-term urban ecology monitoring station of Beijing were discussed. During one year monitoring period, SO_2, NO, NO_2 and NO, had obvious seasonal variation that the concentrations were higher in autumn and winter while were lower in summer. The concentration of O_3 was significantly higher in summer. There had no obvious variations of CO, CO_2 and PM_{10} in the whole monitoring period. The relationships between concentrations of air pollutants and some meteorological conditions were also discussed. All the pollutants had negative correlations with wind speed. With air temperature, SO_2, NO, NO_2 and NO, had negative correlations while CO, CO_2, O_3 and PM_{10} had positive correlations. SO_2, NO and NO, had negative correlations with relative humidity and CO, CO_2, O_3 and PM_{10} had positive correlations with it. NO_2 had no significant correlation with relative humidity.

A Food web based model for cropping system simulation: a first application to banana systems

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Recent experiments on agricultural ecosystems have shown that resilience is the key factor of their sustainability. Here, we suggest that to assess the resilience of agricultural systems with models, it is necessary to consider the complete food web of the simulated systems and not only the productive crops, soil chemistry and eventually crop parasites as usual plant focused cropping systems models do. We attend to reconcile ecological and agronomical approaches through the concept of food web based cropping system model. Food web models are typically used to understand population dynamics and communities structures in many ecosystems e.g. aquatic or soil ecosystems. We specifically present a model aimed at simulating a cultivated field as a foil to the traditional cropping system models. We argue that this concept has different implication for understanding field resilience including the interaction between parasite and non parasite communities, physical and chemical soil characteristics. To this end, we offer contrasting prediction of soil characteristics, crop productivity and parasite populations using the SIMBA model with and without taking into account soil food web structure and interactions. Primary production and most damaging parasites of banana (e.g. plant-parasitic nematodes) are simulated by the standard modules of the SIMBA model. Other trophic levels (i.e. decomposers, primary consumers, omnivores, predators) are accounted within a simple food web module based on bottom-up and top-down control of populations. Incorporating the variation in food web structure into cropping systems models parameterized for banana systems allows more precise and more realistic simulations of production and parasite dynamics. These results provide evidence that incorporating food web structure can be useful in the search for more accurate prediction of cropping system resilience and for designing more sustainable cropping systems. The conceptual framework that we present here is generic and aim to tackle functional biodiversity in other contexts. As a perspective, we discuss the possibility to use measures of natural isotopic abundance to parameterize such a tool.

Keywords: Agrosystem trophic web; resilience; banana cropping system

DETERMINATION OF SORPTION AND LEACHING PARAMETERS OF MALATHION AND ATRAZINE IN THREE INDIAN AGRICULTURAL SOILS

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Movement of pesticides through soils to groundwater and surface waters has long been considered a potentially serious environmental problem in different parts of world. Remediation of such problems requires monitoring of site specific data. Considering these facts a laboratory based investigation has been carried out to determine the sorption and leaching parameters of two contrasting and widely used pesticides (Malathion and Atrazine) in three different agricultural soils: Loamy Sand (Typic Xerosament), Sandy Loam (Acid Lateritic Haplustalf), and Clay loam (Hyperthermic Typic Haplusterts). Standard batch sorption technique was used to determine sorption coefficient (Kd), Freundlich isotherm parameters (Kf and n) and organic carbon distribution coefficient (Koc). Miscible displacement experiment (repacked columns under saturated conditions) was conducted to determine the transport parameters such as pore water velocity (v), diffusion coefficient (D), retardation factor (R) and

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